

REMARKS

By the final Office Action dated July 7, 1995, claims 44, 46-49 and 72-77 have been rejected under 35 USC §112, second paragraph. This rejection is partially based on the term bump and its relationship to the contact. In response to this rejection, the term bump has been removed from the amended claims and is not used in added claims 78-86.

Still further with respect to the §112 rejections, the geometry of the contact was stated in the Office Action to be unclear. The amended claims now state that the contact extends from a surface of the substrate and that the raised portion extends from a surface of the contact. Antecedent basis for the term "extend" is contained on page 13, line 23. In addition, in the drawings the contact (e.g., 16-Figure 6) is shown as extending from the substrate (e.g., 41-Figure 4-6) and the raised portion (e.g., 72-Figure 6) is shown as extending from the contact. The drawings (Figures 4-6) also show the attachment member as separated from the die by a separation distance that is approximately equal to the height of the contact.

Both the presently claimed contact and raised portion of the contact have associated geometrical characteristics that function in a particularly claimed manner. The upper surface of the contact functions as a base to limit penetration into the bond pad and the height of the contact functions to provide a desired separation between the die and attachment member. This separation distance is not suggested by the art and permits the contact to clear particulates between the die and attachment member without affecting the electrical connection therebetween. In addition, this spacing helps to eliminate "cross talk" between the die and attachment member.

The top half of a uniform rod stood on end would not have a surface from which it extends and thus would not meet the claim limitation. In a similar manner a tetrahedron set

on one of its surfaces would not have a raised portion extending from a surface of the tetrahedron and thus would not meet the claim limitation.

Although the different geometries cited in the Office Action could function to limit penetration into a pad, this function would not be inherent unless the penetration force were precisely controlled. There is no suggestion of such a penetration limiting function in the prior art. It appears to be an observation based solely on the hindsight benefit of the present disclosure.

Moreover, in the present case the surface of the contact provides a stop plane for limiting penetration. A rod, tetrahedron or cone does not have an equivalent penetration limiting surface and areas of increased thickness would not function as efficiently as a separate surface as presently claimed. If you consider the base on which such a structure would be mounted as the penetration limiting surface, then there is no separation between the die and the substrate as presently claimed.

With respect to the rejections under 35 USC §102, it is submitted that none of the cited references disclose or teach a penetration limiting structure that also provides a separation distance between the die and attachment member. It is further submitted that this function would not be inherently performed.


The Littlebury et al., elements 17 and 16 were not designed for piercing and maintaining a separation distance. Rather this structure is designed to scrub a bond pad (column 2-line 28). An angular or conical shaped probe as in Liu et al. and Reid et al. could function to resist piercing if the biasing forces were precisely controlled. However, there is no stop plane as with the present invention. Furthermore, there is no suggestion in these references of a penetration limiting function and these contacts were not designed for

penetration limitation or separation. The same argument is restated with Okino et al. and Malhi et al. Any penetration limitation function attributed to these references is submitted to result from a hindsight analysis of the present disclosure.

In view of the above amendments and arguments, it is submitted that the rejections have been overcome and that claims 44, 46-49, 72-77 and 78-84 are now in a condition for allowance. Should any other issues remain, it is requested that the Examiner contact the undersigned by telephone.

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